(No Model.) 3 Sheets—Sheet 1.

G. M. GRISWOLD.

BUTTON SETTING MACHINE.

No. 422,076. Patented Feb. 25, 1890.

Fig. 1.

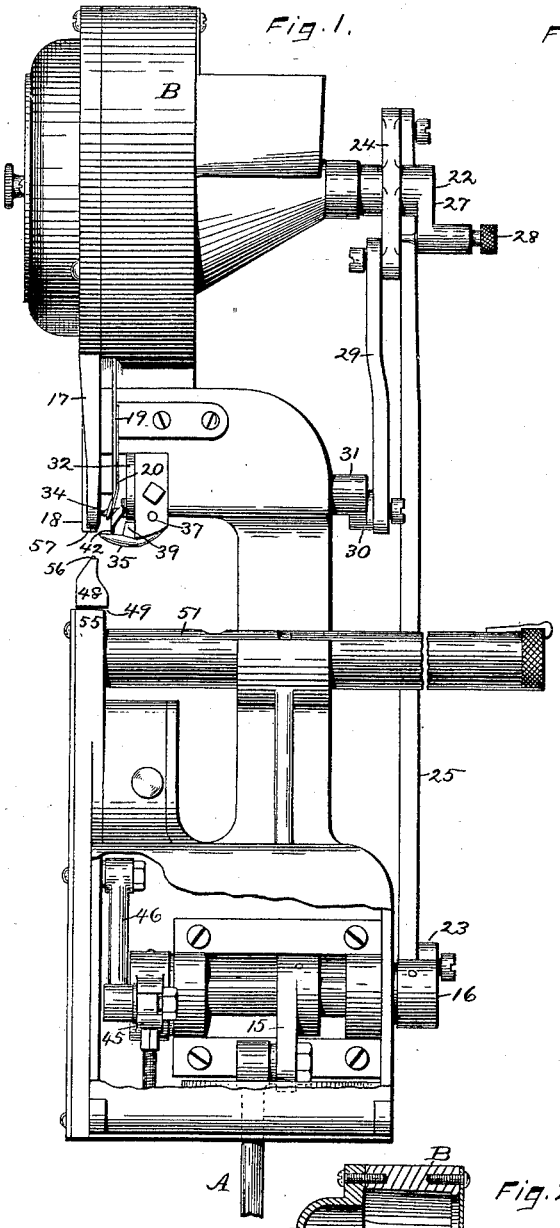


Fig. 2.

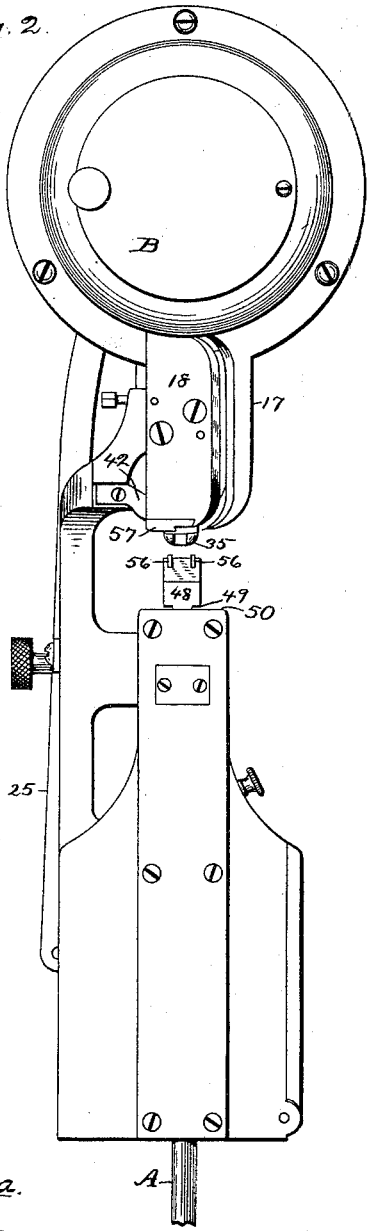
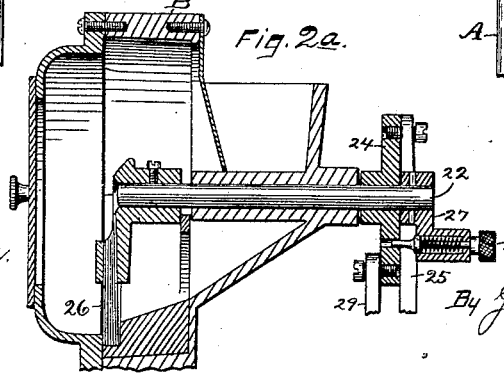


Fig. 2a.



Witnesses.
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Inventor.
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(No Model.) 3 Sheets—Sheet 2.

G. M. GRISWOLD.

BUTTON SETTING MACHINE.

No. 422,076. Patented Feb. 25, 1890.

Fig. 3.

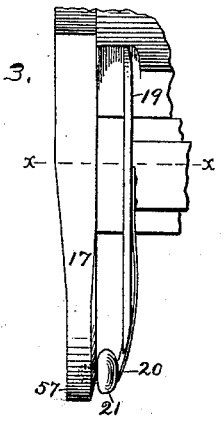


Fig. 4.

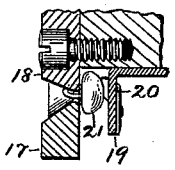


Fig. 5.

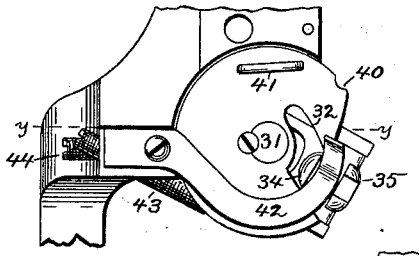


Fig. 6.

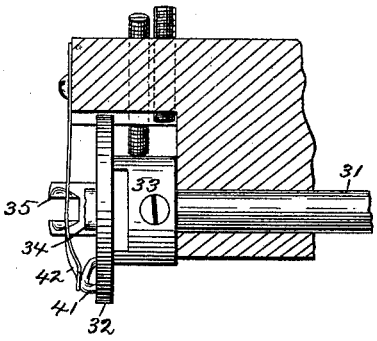


Fig. 7.

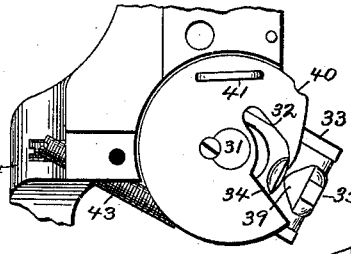


Fig. 8.

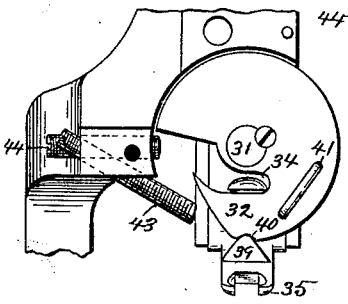


Fig. 9.

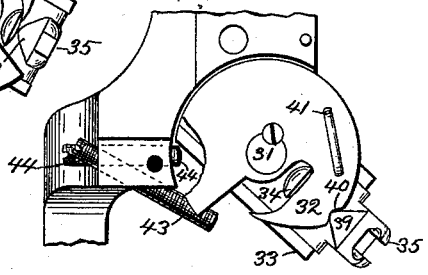


Fig. 10.

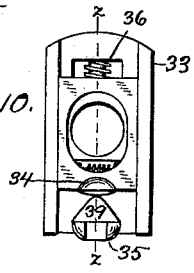
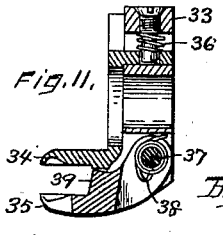


Fig. 11.



Witnesses.
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3 Sheets—Sheet 3.

G. M. GRISWOLD.

BUTTON SETTING MACHINE.

No. 422,076. Patented Feb. 25, 1890.

Fig. 12.

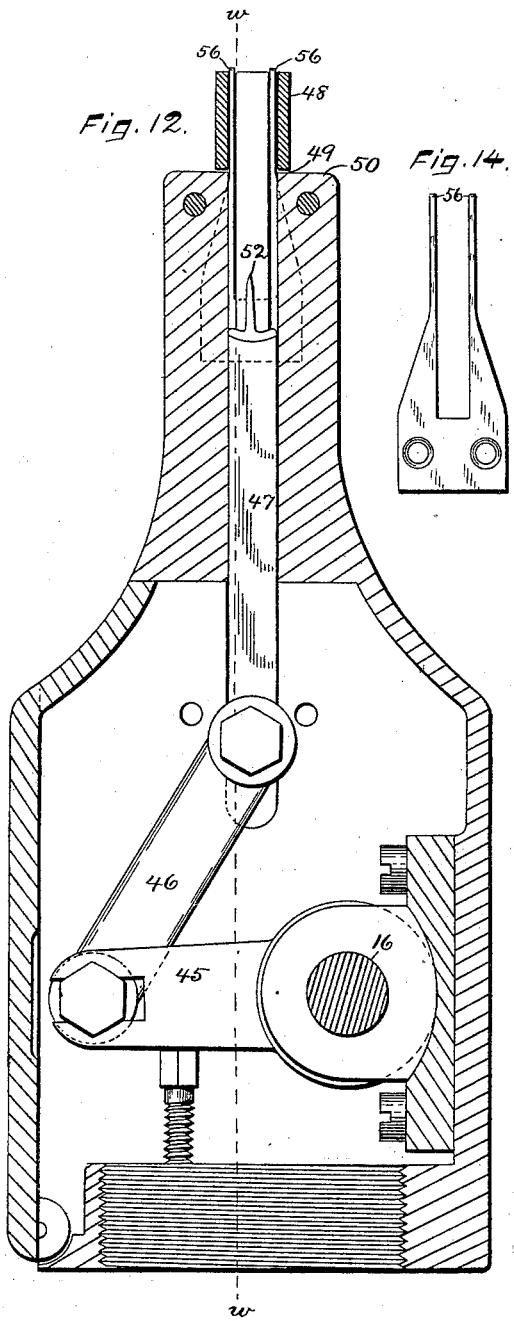


Fig. 14.

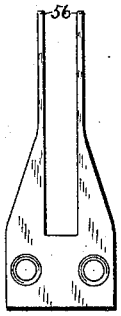
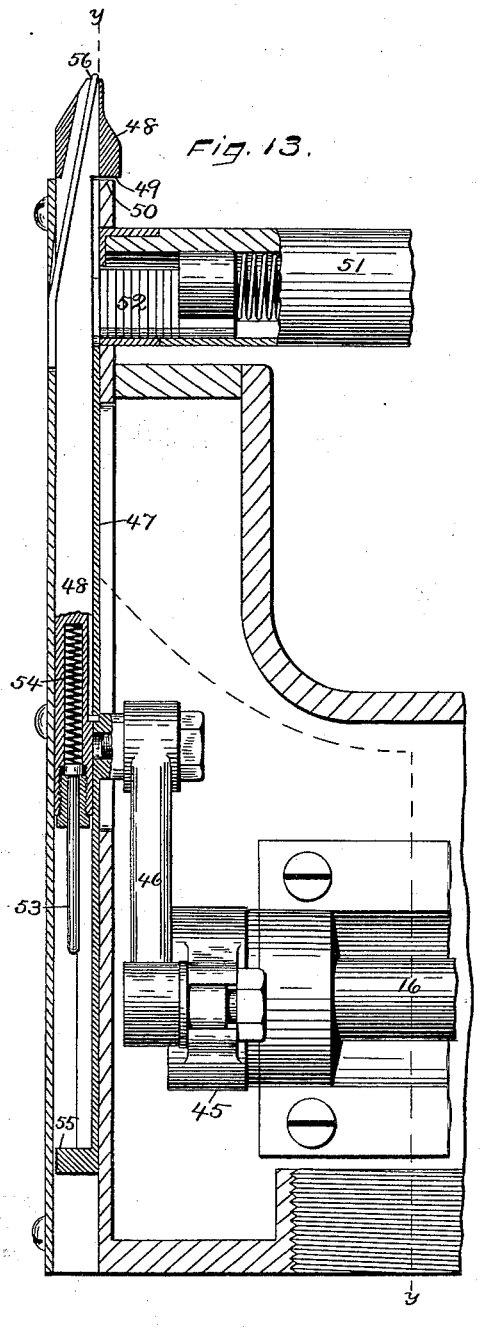


Fig. 13.



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N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE M. GRISWOLD, OF NEW HAVEN, ASSIGNOR TO THE AMERICAN BUTTON FASTENER COMPANY, OF NEW BRITAIN, CONNECTICUT.

BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 422,076, dated February 25, 1890.

Application filed August 19, 1889. Serial No. 321,200. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. GRISWOLD, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Button-Setting Machines, of which the following is a specification.

My invention relates to improvements in automatic button-setting machines; and the main objects of my improvements are to improve the efficiency of the carrier by grasping the button in a chuck and to provide a knock-out to clear the machine after each button has been set.

In the accompanying drawings, Figure 1 is a side elevation of my machine with a portion of the cover of the inclosing-case broken away in order to show other parts. Fig. 2 is a front elevation. Fig. 2^a is a central vertical section of the hopper, partly in side elevation. Fig. 3 is a detached side elevation of the lower end of the button-chute, the scale for Fig. 3 and all of the following figures being twice that of Figs. 1, 2, and 2^a. Fig. 4 is a horizontal section of the same on line $x\,x$ of Fig. 3. Fig. 5 is a front view of a portion of the frame, the carrier, and button-holding spring with the parts at the end of their upward or backward stroke. Fig. 6 is a horizontal section of a portion of the frame and a plan view of the carrier and button-holding spring with the parts at the opposite end of their stroke. Fig. 7 is a front view of a portion of the frame and carrier with the button-holding spring removed, the parts being in the same position as in Fig. 5. Fig. 8 is a like view of the same with the parts at the opposite end of their stroke. Fig. 9 is a like view with the operating-cam of the carrier at the middle portion of its backward stroke and the chuck-jaws at the end of their backward stroke, the jaws being held open by said cam. Fig. 10 is a detached front view of the chuck-jaws and their head. Fig. 11 is a sectional view of the same on line $z\,z$ of Fig. 10. Fig. 12 is a sectional view of the lower portion of the machine on the line $y\,y$ of Fig. 13. Fig. 13 is a sectional view, partly in elevation, of the same on line $w\,w$ of Fig. 12; and Fig. 14 is a detached front view of the knock-out fingers.

The machine is designed for attaching buttons by means of metallic fasteners, and as shown is particularly adapted for use with fasteners known as the "Kempshall button-fastener." It is evident, however, that the particular form of fastener necessitates a special construction only in that portion of the machine through which the fasteners pass. The particular style or kind of fastener is therefore immaterial to that portion of the mechanism that brings the buttons into position to be attached.

The machine is designed to be mounted upon some suitable standard or bench in connection with a foot-treadle or other operating mechanism for imparting an upward-and-downward movement to the driving-rod A, said rod being connected to the crank-arm 15 of the crank-shaft 16, so that an oscillating motion may be imparted to said shaft.

At the upper end of the machine there is a hopper or receptacle B for buttons, leading from which hopper is the button-chute, composed of two side guides 17 and 18, with a space between, through which the eye of the button passes, and a rear guide 19 for engaging the summit of the button-head and preventing the eye from working out of the space between the side guides. The lower end of this rear guide is provided with a stop-spring 20 (see Figs. 1, 3, and 4) to stop and hold the lowermost button within the chute at a short distance above the lower end thereof, as shown by the position of the button 21 in Figs. 3 and 4. A hopper-shaft 22, Fig. 1, is mounted concentrically with the button-receptacle B and carries a stirring device 26. The hopper and stirring device, aside from the manner of driving the latter, are of an ordinary construction, and not essential to my invention. In so far as the main features of the machine are concerned the button may be supplied to the chute by any ordinary mechanism, or even by hand, if desired. The crank-shaft 16 has at its rear end a crank-arm 23, to which one end of a pitman 25 is attached, while the other end of said pitman is attached to the double crank or cross-arm 24, loosely

mounted on the hopper-shaft 22. The end of the shaft 22 is provided with a rigid crank 27, having a spring-pressed pin 28, that engages a hole in the cross-arm 24, so that by disengaging said pin the hopper-shaft 22 may be revolved by hand independently of the other parts to revolve the stirring device, while by engaging said pin with said cross-arm the hopper-shaft will be operated through said cross-arm pitman 25 and connected mechanism. The other end of the cross-arm 24 has a pitman 29 attached thereto, which is connected with and operates the crank 30 of the carrier-shaft 31. Said carrier-shaft has suitable bearings in the frame of the machine at a point in rear of and near the lower end of the chute. At its front end there is an operating-cam 32 rigidly mounted on said shaft, and loosely mounted on said shaft just back of said cam is the head 33, carrying the chuck-jaws 34 and 35. The jaw 34 slides radially in the head 33, and is pressed upon by the spring 36 (see Figs. 10 and 11) to hold it in its normal position, while the jaw 35 is preferably hung on a hinge or pivot, as at 37, Fig. 11, so as to swing outwardly, and is forced inwardly by a torsion-spring 38, coiled about its pivot in the ordinary manner of mounting such springs. Said jaw is also provided with a projecting and rounded inner face 39 for engagement with the edge of the cam 32, and said cam is provided with a notch or recess 40 for receiving said inner face of said jaw. The front of the cam 32 is also provided with a supplemental cam 41 for engaging and pressing it forward, as shown in Fig. 6, the other end of said spring being secured to the frame of the machine. The movement of the chuck-carrying head 33 is limited in one direction by the stop 43, as best shown in Fig. 8, and in the other direction by the stop 44, as shown in Fig. 9. Thus it will be seen that the chuck-jaws are moved to and from each other for opening and closing them, and also that by being mounted on the head 33, that is carried by the oscillating shaft 31, they are moved bodily in an oscillating path.

Within the case at the lower part of the frame there is an arm 45 on the shaft 16, connected by a pitman 46 to the driver 47. A guide 48 is connected with said driver so as to have a sliding motion relatively thereto, and its upper end has a passage-way for the passage of the fasteners and the upper end of the driver and knock-out fingers. The downward movement of said guide is limited by the shoulder 49 coming in contact with a stationary part 50 of the frame, and its upward movement is limited by contact with the die or anvil 57, that is formed or set in the lower end of the piece on which the side guide 18 of the button-chute is formed.

A magazine 51 of a well-known construction—as, for instance, such as is shown in Patents Nos. 310,541, 311,033, and 353,818 to Francis H. Richards—contains the fasteners 52 and presents them one by one to the upper end of the driver. The lower end of the guide 48 contains a plunger 53 and its spring 54, and the lower end of the driver has a projection 55 for acting upon the lower end of said plunger.

The driver, the guide, and their operating mechanism are all old and not of my invention, and therefore a further description is considered unnecessary. I, however, combine with said parts the spring knock-out fingers 56 56. These fingers are formed of one piece of spring-steel, the base of which is secured to a stationary part of the frame, with the fingers extending up through the top part of the guide and about flush with or slightly projecting above the top end thereof. The space between the fingers is wide enough to receive the shank of the guide, but is of a little less width than the length of the head of the fastener, as shown in Fig. 12.

In Fig. 13 the knock-out fingers are shown in side elevation and not sectioned, thereby showing that their upper ends project into the path of the fasteners and driver.

In operating my machine the chute is first filled with buttons and the magazine with fasteners. The buttons may be placed in the hopper promiscuously, and in order to work them into the chute without operating the other parts of the machine the spring-pin 28 may be withdrawn from the cross-arm 24 to unlock the crank 27, after which said crank and crank-shaft may be turned to operate the stirring device for filling the chute. Were it not for the spring-pin, crank, &c., the stirring device could be operated only by moving the crank-shaft 16 and the parts which said shaft drives, and several movements thereof might sometimes be required before a button would fall down in the chute and be presented to the carrier, while the fasteners would be forced up and clinched and thereby wasted. By means of spring-pin, crank, &c., the button-chute may be filled preparatory to starting without working the rest of the machine. This is especially important when it is desired to make frequent changes in the size or style of buttons to be set—as, for instance, in retail stores. The button-chute having been filled, the lowermost button therein will rest upon the stop-spring 20, as shown in Figs. 3 and 4, and it is grasped by the chuck-jaws 34 and 35 on their return movement in a manner hereinafter described, and the carrier-shaft 31 stops with the parts in the position illustrated in Figs. 5 and 7. The foot-treadle or other operating devices move the crank-shaft 16 to force the crank-arm 23 upwardly and thereby through the pitmen 25 and 29, and their connections move the hopper-shaft and stirring device and also the carrier-shaft 31. The nose or point of the cam 32 presses against the confronting engaging faces of the chuck-jaws 34 and 35 and thereby bodily carries said jaws and the button within them from the position shown in

Figs. 5 and 7 into the position shown in Figs. 1 and 2 and presents the eye of the button to the under side of the die or anvil 57. The stop-spring 20 yields to release the button as the chuck-jaws advance and springs back again to stop the next button in proper position within the chute the same as before. The summit or back of the button-head is now pressed upon by the button-holding spring, so as to hold the head of the button against the back of the die. The chuck-head 33 is now arrested by the stop 43, so that it can move no farther; but the carrier-shaft 31 and cam 32 still move on to force the pointed end of the cam between the chuck-jaws to open them for releasing the button therefrom, as shown in Fig. 8, while the supplemental cam 41 is forced under the free end of the button-holding spring 42, as shown in Fig. 6, to hold the button in place after it is released from the jaws. On the first part of the stroke of the arm 45 of the shaft 16 the driver 47 moves upwardly, while the guide 48 is stationary until the projection 55 engages the lower end of the spring-pressed plunger 53 and carries the front one of the fasteners 52 up into the top part of the guide 48. Said guide then, under the action of the projection 55 and plunger 53, is moved upwardly with the driver until the top of the guide strikes the work lying between it and the die 57. The spring-fingers are held down by being attached to the frame and their ends are merely sprung forward as the fastener and upper end of the driver are pushed by them. The prong of the fastener is forced up through the work and eye of the button and clinched against the die in the ordinary manner. The movement of the shaft 16 is now reversed. The driver and guide descend together until the latter is stopped by the shoulder 49 and stationary part of the frame 50, while the driver moves on for the remainder of its stroke. As the driver and guide descend, the upper ends of the spring knock-out fingers engage the under side of the head of the fastener at each end of said head, and thereby force the work from the guide as said guide reaches its lowermost position, provided there is any tendency of the work to adhere thereto or to clear the guide in case of any obstruction. As the carrier-shaft 31 and cam 32 make their return-stroke upon the reversal of the crank-shaft 16, the open chuck-jaws, by engaging the cam with all the force of the springs that close the jaws and by the inner face 39 of the jaw 35 and recess 40 of the cam, are carried bodily back to a position in the rear of the lowermost button in the chute, when the further return movement of said jaws and head 33 is arrested by the stop 44, (see Fig. 9,) so that on the continued movement of the cam it is withdrawn from the jaws and their springs close them upon the lowermost button in the chute, when they are ready to be carried forward upon the next forward movement of the cam, as before described.

I am aware of the Patent No. 249,255, November 8, 1881, and I hereby disclaim what is therein shown and described.

I claim as my invention—

1. In a button-setting machine, the combination of the pitmen 25 and 29, shafts 16 31, the receptacle B, crank-shaft 22, the stirring device 26, mounted on said crank-shaft within said receptacle, the crank 27, the cross-arm 24, loosely mounted on the shaft 22 and connected with said pitmen, and a locking mechanism—as, for instance, the spring-pin 28—for connecting and disconnecting said cross-arm and crank-shaft, substantially as described, and for the purpose specified.

2. In a button-setting machine, the combination of a button-chute, the spring-stop for arresting the lowermost button in a given position in said chute, a carrier having chuck-jaws located relatively to the position of said button within said chute as to bring said button when thus arrested within the path of said jaws, and mechanism, substantially as described, for opening and closing said jaws and also for moving them bodily to and from the position for the button that is arrested by said stop, substantially as described, and for the purpose specified.

3. In a button-setting machine, the combination of the carrier-shaft 31, mechanism for oscillating said shaft, the head 33, loosely mounted on said shaft, suitable stops for limiting the movement of said head, chuck-jaws mounted in said head and fitted to open and close, and the operating-cam 32, substantially as described, and for the purpose specified.

4. In a button-setting machine, the combination of a button-chute, an anvil or die 57, the carrier-shaft 31, mechanism for oscillating said shaft, the head 33, loosely mounted on said shaft, suitable stops for limiting the movement of said head, chuck-jaws mounted on said head, the operating-cam 32, the button-holding spring 42, and supplemental cam 41, for acting upon one end of said spring, substantially as described, and for the purpose specified.

5. In a button-setting machine, the combination of the carrier-shaft 31, mechanism for oscillating said shaft, the head loosely mounted on said shaft, suitable stops for limiting the movement of said head, the chuck-jaw 34, sliding radially in said head, the jaw 35, pivoted in said head, the springs for forcing said jaws toward each other, and the operating-cam 32, substantially as described, and for the purpose specified.

6. In a button-setting machine, the combination of the carrier-shaft 31, mechanism for oscillating said shaft, the head 33, loosely mounted on said shaft, suitable stops for limiting the movement of said head, spring-pressed chuck-jaws 34 and 35, mounted on said head, one of which jaws is provided with

a projecting and rounded inner face, as at 39, and the operating-cam having the recess or notch 40 for engagement of said inner face 39, substantially as described, and for the purpose specified.

7. In a button-setting machine, the combination of a button-chute, the spring-stop for arresting the lowermost button in a given position in said chute, an anvil or die 57, the button-holding spring 42, a carrier having chuck-jaws, a supplemental cam for acting on said button-holding spring, and mechanism for opening and closing said jaws and moving them bodily to and from said button-chute and die, substantially as described, and for the purpose specified.

8. In a button-setting machine, the combination of the driver, guide, and operating mechanism with the spring knockout-fingers, substantially as described, and for the purpose specified.

GEORGE M. GRISWOLD.

Witnesses:
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T. H. CAMP.